

**Raymond High School, New Hampshire**  
**Preliminary Opinion of Probable Cost**  
**Raymond High School Municipal Connection - Option 2**  
**Buried pipeline from municipal main to school; entrance via woodshop; booster pumps in the water room**

1/17/2017

Item	Probable Cost	Totals
<b>Construction &amp; Engineering</b>		
General Requirements (11.5% of Construction Cost)	\$9,600	
4-inch water main from municipal main to school (approx 170 ft)	\$20,000	} \$28,600 (being paid for by town)
Trench patch - parking lot - main to building (120 ft)	\$3,600	
Cut floor in woodshop; pipe entranced, backfill; patch floor	\$5,000	
New service entrance piping (meter; backflow)	\$3,800	
2" Cu piping inside building (170 ft)	\$12,750	
New booster pumps	\$10,800	
New control panel/system	\$15,000	
Piping changes in water room (disconnect tank & well; misc piping & valves)	\$5,000	
Site Work (restoration - loam & seed)	\$0	
Remove softener & chlorine system	\$1,500	
Abandon and demolish existing storage tank; fill with sand	\$6,000	
<hr/>		
<b>Subtotal</b>	\$93,050	
<b>Contingency (20% of construction)</b>	\$18,600	
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<b>Total Probable Construction Cost (round to nearest \$1,000)</b>	\$112,000	
<b>Engineering at 25%</b>	\$28,000	
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<b>Total Construction &amp; Engineering</b>		\$140,000
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<b>Total Project Cost</b>		\$140,000

less costs picked up by town < 28,600 >  
\$111,400

Capital Improvement Plan Budget for project	\$110,000
Less ESTIMATED Engineering Cost	(25,000)
Remaining Budget for project	<u>85,000</u>

2108.90

September 22, 2017

Mr. Todd Ledoux, Facilities Director  
Raymond School District  
43 Harriman Hill Road  
Raymond, NH 03077

**Re: ESR #2**  
**Raymond High School**  
**Raymond, New Hampshire**  
**Interior Water Service Connection**

Dear Mr. Ledoux:

In accordance with your request, we have prepared the following scope of work to conduct the preliminary and final design of the High School service connection from the existing service in the Woodshop Room to the existing domestic system in the Water Room.

If this proposal is acceptable to you, please have all three copies of ESR No. 2 signed, keep one copy for your records, and return two copies to Underwood for further execution. A fully executed copy will be returned to you for your records.

Please do not hesitate to call if you have questions regarding this proposal. We look forward to working with you.

Very truly yours,

UNDERWOOD ENGINEERS, INC.



Lynnette Carney, P.E.  
Senior Project Engineer



Michael B. Metcalf, P.E.  
Senior Project Manager

Encl: (3) ESR No. 2

cc: Keith Pratt, Tim Noble, UE

ENGINEERING SERVICES REQUEST  
AUTHORIZATION TO PROCEED

To: Underwood Engineers, Inc. (**Engineer**)  
25 Vaughan Mall  
Portsmouth, New Hampshire 03801

ESR No.: 2  
File No.: 2108  
Date: September 22, 2017  
Description:  
**Interior Water Service Connection -  
Raymond High School**

From: Raymond School District (**Owner**)  
43 Harriman Hill Road  
Raymond, NH 03077

Owner's Contact(s) (this project): Mr. Todd Ledoux, Facilities Director  
Engineer's Contact(s) (this project): Mr. Michael B. Metcalf, P.E., Sr. Project Manager

Under agreement for Professional Services as Consulting **Engineer** for the **Owner** (General Services Agreement UE # 2107 dated August 12, 2016), **Engineer** is authorized to proceed with the following work:

**Description:**

**Background/Project Understanding**

As part of the Well #4 project, the Town's contractor has installed a 4-inch ductile iron (DI) water main from the new 8-inch municipal main near the SAU building through the foundation wall of the High School. They will also be cutting the floor in the Woodshop Room and installing the 4-inch DI main up through the floor and capping it.

This proposal is for design of an extension of that pipeline from the capped location in the Woodshop Room, to the existing domestic water piping in the Water Room. The school was constructed in approximately 1997 and domestic water facilities for the school are located in the Water Room, which is a small triangular shaped room on the interior of the building.

Water is currently obtained from a well on the north side of the building and piped to the Water Room, where sodium hypochlorite is added, and then it is piped to an approximately 15,000 gallon (domestic) buried storage tank located in the yard, adjacent to the front entrance of the building. Sodium hypochlorite is added to the water using a day tank and LMI pump. Once the municipal connection is made, the piping from the well and to/from the storage tank will be capped and abandoned. The fate of the domestic storage tank will need to be determined by the School, if it is to remain and possibly converted to fire storage or another use in the future, or if it will be abandoned and demolished.

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A previous evaluation by UE in January 2017 concluded that adequate pressure will not be available at all times from the municipal water system, and therefore the existing booster pumps will need to be retained/replaced. Also, the existing fire suppression system, including the buried fire storage tank (located in the front of the building) and the fire pump will need to be retained. The fire storage tank will continue to be filled manually from the domestic supply as it is currently.

The existing booster pumps are Burks Pumps, Catalog # 375GMV7-2-6.88; serial numbers 519237 (pump 1) and 519236 (pump 2). These pumps are old and in need of replacement. In addition, the new hydraulic conditions from the municipal main will be different than current conditions with the storage tank.

There are currently two (2) Mercooid switches (one for each booster pump) on the side of the control panel. They appear to be set for 40 psi (pump on) and 60 psi (pump off). This control system will be reviewed for correct operation with the new municipal connection. At this time, we have assumed that no major electrical or control changes will be needed. We anticipate the new booster pumps will be similar or smaller in horsepower to the existing pumps, and any of the existing functions in the control panel which are no longer needed (i.e. tank level, etc.) will be abandoned, with the pressure control of the booster pumps retained.

The booster pumps currently convey water from the domestic storage tank, through a 1.5-inch meter, a manifold of 4 large hydropneumatic tanks (each estimated at 120 gpm +/-), and then either through a softener to the domestic distribution system, or to an approximately 12,000 gallon buried fire storage tank. There is a backflow preventer on the piping to the fire storage tank. The fire storage tank is reportedly filled manually, using a manual valve located downstream of the backflow preventer. If the level gets low, the valve is opened manually to fill the tank. The fire storage tank, backflow preventer and manual fill valve will be retained in the new system. The hydropneumatic tanks will remain, and the meter will be replaced.

### **Scope of Services:**

The scope of this work includes design of the water piping from the new 4-inch municipal service entrance on the south side of the building, to the existing domestic system in the water room. This work is anticipated to include the following:

- New meter and backflow preventer, purchased from the Town's vendor.
- New piping from the new service main in the Woodshop Room to the Water Room.
- New booster pumps.
- Piping modifications in the Water Room, including a booster pump bypass with check valve, removal of the existing meter, new pressure gages, removal of the existing water softener, and capping of the existing piping from the well and domestic storage tank.
- Removal of sodium hypochlorite feed system.
- Re-use of the existing control panel and electrical feeds.

### **Task 1 –Design**

We will initially prepare a list of design criteria and 30% drawings for review by the School, Town and NHDES to ensure that all parties are satisfied with the design concepts before finalizing the documents for bid.

Preliminary Design will include the following:

- Develop building base plans from existing 1997 building/architectural construction drawings
- Measure and draw a one-line piping diagram of the Water Room
- Based on existing fixture quantities in the building, coordinate with the Town to size the meter and identify the necessary meter and backflow device models.
- Coordinate with the School and the Town to identify acceptable locations for the meter and backflow device.
- Identify piping changes to accomplish the following: These changes will be shown on a one-line schematic drawing of the water room.
  - Cut and cap piping from the well
  - Cut and cap piping to/from the domestic storage tank
  - Install new flowmeter and backflow prevention device
  - Disconnect and remove the existing softener
- Discuss with the School, the ultimate fate of the well and storage tank, including the level of abandonment to be included in the work (removal of existing well pump, emptying existing tank, demolition or removal of existing tank, etc.) and obtain concurrence from NHDES.
- Size booster pumps and evaluate the need for and functioning of an automatic booster pump by-pass line. Evaluate pump operational/control scenarios. Evaluate necessary electrical and control panel modifications.
- Identify a sequence of construction to maintain water service to the school throughout construction of the new connection and pump replacement.
- Prepare a list of design criteria/basis of design outlining the proposed design for the system.

After approval of the design concepts and layout from the Preliminary Design phase, we will proceed with the finalizing the drawings and preparing Contract Documents for bidding as described below:

#### Construction Drawings

- Prepare plans and details of the proposed improvements at an appropriate scale. Contract drawings will be prepared using AutoCAD. Anticipated Drawings include:
  - General notes and legend.
  - Demolition plans and details
  - Process/Mechanical plans, cross sections and details.

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Technical Specifications

- Prepare technical specifications in Construction Specification Institute (CSI) format.

Bidding Documents

- Prepare bidding documents, including contractual conditions and instructions to bidders, using standard NHDES contract documents (or others as provided by the SAU). Unit price and lump sum bidding will be used where appropriate.

Opinion of Cost:

- Update an opinion of probable construction cost.

Meetings and Public Information:

- Conduct one site visit to review existing conditions and measure existing spaces
- Attend up to one (1) design meeting with School personnel

Applications for Approvals:

- Underwood Engineers will assist the School in preparing applications for the following approvals anticipated for this project:
  - NHDES Drinking Water and Groundwater Bureau design review.
- The Contractor may be required to obtain a plumbing permit from the Town.

Deliverables

- A bulleted basis of design list to summarize the preliminary design with 30% plans for review and concurrence.
- Two (2) paper copies and one (1) digital copy (.PDF) of the final Construction Drawings and Project Manual (technical specifications and bidding documents)
- Updated Opinion of Probable Cost.

Limitations and Assumptions:

- No changes will be made to the existing fire suppression system. The fire storage tank will be manually filled from the municipal water system service, rather than from the well.
- No changes to the domestic water plumbing will be made outside of the water room. The only changes will be on the supply side and within the water room.
- Existing fixture counts will be provided by the School.
- No electrical changes will be required and no electrical drawings provided. Existing power feed, pump starter and disconnect can be reused.
- Existing control panel can be re-used, with some existing controls abandoned as necessary.
- No work on the existing domestic storage tank at this time (no abandonment or removal).
- Well pump will be removed but the well will not be abandoned.

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Work Not Included:

- Field testing
- Bidding
- Construction Administration

Provided by the Owner

- Fixture counts for the building
- Architectural plans of school
- Plans and details for existing well and storage tank
- Control panel wiring diagram

**BUDGET COSTS**

The budget estimate for the tasks outlined in the Scope of Work is **\$20,300**.

Fees also include reimbursement for subconsultants, transportation expenses, out-of-pocket travel expenses (tolls), prints, telephone calls and miscellaneous materials that may be required to complete the work.

Fees for engineering services will be on an hourly basis for the personnel involved. Such hourly fees will be based on the Engineer's technical payroll plus an allowance to cover overhead and profit, all of which is in accordance with standard practice of the American Council of Engineering Companies. Fees for subconsultants are included in the amount above and will not be marked up.

**Budgets:**

Suggested budgets, as used herein, are best estimates by Underwood Engineers. The budgets are based on available information and prior to a detailed research on the Project. Budgets are not intended to be fixed prices but are reasonable estimates of average costs to complete projects of similar size. Engineer will not exceed the budget without written authorization.

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**Approval:**

Approval and authorization to proceed with the work:

\_\_\_\_\_  
Raymond School District, Raymond, NH     Date  
*Joe Sautner* Chair, Raymond School Board

\_\_\_\_\_  
Keith Pratt, P.E., President     Date  
Underwood Engineers, Inc.



# Raymond School District

## Summary of Capital Reserve Fund Balances

	<u>Balance as of 2/28/18</u>	<u>Appropriations 18 - 19 School Year</u>	<u>Anticipated Projects Before RFP's</u>	<u>Projected Balance</u>
			(10,000) LRES Secure Front Entry Way	
			(11,000) IHGMS Secure Front & Gym Entry Ways	
			(92,544) LRES Bathrooms - Upgrade 1 Set	
			(25,000) RHS - Engineering Design for Water Line	
			(85,000) RHS - Connection to Town Water Line	
<b>District Wide Maintenance</b>	454,150	202,544		483,150
<b>District Wide Textbook</b>	15,369		(15,369) Science Kits for grades K - 4	0
<b>District Wide Technology</b>	53,902	13,142	(13,142) Firewall Replacement	53,902
<b>District Wide Food Service</b>	25,135	19,714		44,849
<b>District Wide Special Education</b>	183,562			183,562
<b>Total Capital Reserve Fund Balances</b>	<u>732,118</u>	<u>285,400</u>	<u>(252,055)</u>	<u>765,463</u>